LIFE CYCLE COSTING FOR
RESOURCE RECOVERY FACILITIES

STUART H. RUSSELL and MARY K. WEES
Henningson, Durham & Richardson, Inc.
Onisha, Nebraska

Discussion by

Jeffrey F. Clunie
R. W. Beck and Associates
Wellesley, Massachusetts

The authors have presented a paper which would be helpful to planners involved in the evaluation of alternative methods of solid waste disposal. This is particularly true for communities attempting to compare the estimated total future costs of solid waste disposal at either a sanitary landfill or at a highly capital intensive, revenue producing resource recovery facility. The application of a Life Cycle Costing (LCC) methodology has long been in use in developing estimates of the relative costs or financial returns on investment among alternative projects. LCC is being highly utilized at the present time within the electrical utility industry in evaluating the economic feasibility of hydroelectric facilities which, due to their high initial capital cost and low annual operating cost, may not be financially feasible during the initial years of operation of the facility but which may eventually indicate a positive return to a utility over the life of the project. The proper application of LCC can prove useful in helping to project when a facility can be expected to reach an economic break even point and such projections are being used in developing schedules for the repayment of the principal on long term revenue bonds. Where the authors' paper generally addresses the principles of LCC, it is the purpose of this discussion to briefly identify those applications of LCC which our experience has found to be most appropriate.

As the authors have indicated, the use of LCC as an economic analytical tool has become increasingly important in evaluating solid waste resource recovery projects. Its value is demonstrated not only in evaluating the economics of competing, alternative proposals for different solid waste resource recovery facilities, but to an even greater extent in comparing the total projected costs of disposal to a community during the estimated useful life of a resource recovery project with the total projected cost associated with continued disposal at a sanitary landfill. Developing a meaningful estimate of the net cost of disposal to a community from either a resource recovery facility or a sanitary landfill can be most difficult due to the significant difference in the basic characteristics of the two alternatives, particularly when the two alternatives are being compared for a 20 or 25 year period. A resource recovery facility is often characterized by high capital costs, high operating and maintenance expenses and the existence of revenues from the sale of energy and other recovered products. A sanitary landfill typically has much lower capital and operating costs; however, it will not have any offsetting revenues from the sale of recovered energy and materials. Utilizing LCC often represents the most viable means of comparing the net cost of disposal between two such diverse alternatives.

As the authors have also indicated, LCC also allows for the preparation of a whole series of...
sensitivity analyses which can be most important to today’s planners. Confronted with unexpectedly high levels of inflation and interest rates and with a continually spiralling cost of energy, planners are better able to evaluate the effect which changes in these and other variables will have upon the economic feasibility of various alternatives by using LCC under different sets of assumptions and operating scenarios.

Following the selection by planners of the most financially feasible project from all of the available alternatives, project planners and developer/owners may find that the continued use of LCC will prove to be a most valuable marketing tool as the proposed resource recovery project moves from the planning stage on to long term financing and ultimately to construction and operation. Since a large number of the solid waste resource recovery facilities are being financed by means of the issuance of revenue bonds, it is increasingly desirable to have executed long term contracts which guarantee revenues from both solid waste disposal fees and the sale of energy and recovered materials. Confronted with an inherent level of technical risk, prospective purchasers of revenue bonds often seek to reduce the financial risk by demanding that the revenue producing contracts for the sale of energy and the disposal of solid waste be executed for periods which are coterminous with the repayment period of the bonds. To actually execute such contracts with the energy and disposal customers of a resource recovery project can prove most difficult, particularly when the benefits of the project are more long term in nature than immediate. Utilizing the results of an LCC analysis as a marketing tool may help to convince potential customers that the long term economic incentives are sufficient to warrant executing a long term contract.

I would, however, offer one word of caution concerning the application of LCC. It must be realized that the results of an LCC analysis are only as meaningful as the assumptions and data which were used as input. Long term projections of operating results are subject to unforeseen changes in both the economy and technology. The rate of inflation in our current economy and the ongoing energy problem have invalidated projections which we prepared as recently as four years ago. Therefore, I would strongly recommend that in developing and structuring the actual financial and contractual arrangements of any resource recovery project, one should understand the assumptions used in the development of the LCC analysis and consider the results of the LCC analysis as only a guide in reaching a final decision. Sufficient flexibility must be built into all rate and tariff schedules, revenue producing contracts and operating agreements in order to provide adequate assurance that operating revenues can be adjusted to meet operating and maintenance expenses and debt service requirements in the event actual operating results do not coincide with projected operating results.

To briefly summarize, LCC can be a most valuable analytical tool for comparing the cost of alternative projects and obtaining long term commitments for the sale of energy and disposal of solid waste. However, a certain amount of caution must be exercised when using the results of LCC as the basis for developing and structuring actual financial arrangements.